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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/550,095

09/21/2005

Philip St. John Russell

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EXAMINER

WOOD, KEVIN S

ART UNIT

PAPER NUMBER

2874

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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| 3 MONTHS | 04/04/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/550,095 | Applicant(s) RUSSELL ET AL. | |
| | Examiner Kevin S. Wood | Art Unit 2874 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 52-71 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 52-71 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>12/21/2007</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Preliminary Amendment

1. Claims 1-51 have been cancelled. New claims 52-71 have been added. Claims 52-71 are pending in the application.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 58 and 69 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what is meant by *at least a proportion y of the boundary*. It is also unclear what is meant by $y > 0.5$. For the purposes of examination, the examiner assumes that the core boundary is required to have a thickness t around at least a portion of the boundary.
4. Claim 56 and 67-71 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what is meant by *F-factor*. This term has not been properly defined either within the specification or within the claim. These claims cannot be properly examined because it is unclear what is included and what is excluded by these claimed limitations.

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5. Claim 63 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what is meant by *t > u* for a portion of the boundary *y*, where *u* > 0.06 and *y* > 0.5. These variables have not been defined and have no units. Therefore the claim is indefinite and the examiner is unable to determine what has and has not been claimed. For the purposes of examination, the examiner assumes that the core boundary is required to have a thickness *t* around at least a portion of the boundary.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claim 66 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S.

Patent No. 6,778,749 to Allan et al.

Referring to claim 66, the Allan et al. reference discloses all the limitations of the claimed invention. The Allan et al. reference discloses a photonic crystal fiber, comprising an elongate, relatively low refractive index core (12,20); an elongate photonic bandgap structure surrounding the core and comprising in the transverse cross

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section, a lattice of relatively low refractive index regions (3) separated by connected relatively high refractive index regions; and a concentric boundary region, at the interface between the core and the photonic bandgap structure, the core boundary region being generally thicker around its circumference than regions of relatively high refractive index in the photonic bandgap structure. See Fig. 1 through Fig. 9, along with their respective portions of the specification.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 52-54 and 57-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,778,749 to Allan et al.

Referring to claims 52, and 57-64, the Allan et al. reference discloses all the limitations of the claimed invention. The Allan et al. reference discloses a photonic crystal fiber, comprising an elongate, relatively low refractive index core (12,20); an elongate photonic bandgap structure surrounding the core and comprising in the transverse cross section, a lattice of relatively low refractive index regions (3) separated by connected relatively high refractive index regions; and a concentric boundary region, at the interface between the core and the photonic bandgap structure, the core boundary region being generally thicker around its circumference than regions of relatively high refractive index in the photonic bandgap structure. See Fig. 1 through Fig. 9, along with their respective portions of the specification. The Allen et al. reference does not appear to specifically disclose that more than 95% of the guided light is in the regions of relatively low refractive index in the waveguide. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have more than 95% of the guided light guided in the regions of relatively low refractive index in the waveguides, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980). Light guided through low refractive index materials experiences low attenuations and small non-linear coefficients, therefore one would be motivated to maximize the amount of light propagated through the low refractive index portions of the waveguide.

Referring to claims 53 and 54, the Allan et al. reference discloses all the limitations of the claimed invention. The Allan et al. reference discloses a photonic

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crystal fiber, comprising an elongate, relatively low refractive index core (12,20); an elongate photonic bandgap structure surrounding the core and comprising in the transverse cross section, a lattice of relatively low refractive index regions (3) separated by connected relatively high refractive index regions; and a concentric boundary region, at the interface between the core and the photonic bandgap structure, the core boundary region being generally thicker around its circumference than regions of relatively high refractive index in the photonic bandgap structure. See Fig. 1 through Fig. 9, along with their respective portions of the specification. The Allen et al. reference does not appear to specifically disclose that more than 1% or more than 50% of the guided light is guided within the low refractive index core portion of the waveguide. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have more than 1% or more than 50% of the guided light is guided within the low refractive index core portion of the waveguide, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F. 2d 272, 205 USPQ 215 (CCPA 1980). Light guided through low refractive index materials experiences low attenuations and small non-linear coefficients, therefore one would be motivated to maximize the amount of light propagated through the low refractive index portions of the waveguide.

Referring to claim 65, the Allan et al. reference discloses all the limitations of the claimed invention. The Allan et al. reference discloses a photonic crystal fiber, comprising an elongate, relatively low refractive index core (12,20); an elongate photonic bandgap structure surrounding the core and comprising in the transverse cross

section, a lattice of relatively low refractive index regions (3) separated by connected relatively high refractive index regions; and a concentric boundary region, at the interface between the core and the photonic bandgap structure, the core boundary region being generally thicker around its circumference than regions of relatively high refractive index in the photonic bandgap structure. See Fig. 1 through Fig. 9, along with their respective portions of the specification. The Allen et al. reference does not appear to specifically disclose the claimed equation for selecting the desired boundary thickness. It would have been obvious to one having ordinary skill in the art at the time the invention was made to derive an equation for selecting the workable or optimum boundary thickness, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin S. Wood whose telephone number is (571) 272-2364. The examiner can normally be reached on Monday-Thursday (7am - 5:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney B. Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KSW

A handwritten signature in black ink that reads "Kevin & Wood". The signature is written in a cursive, flowing style.

KEVIN WOOD
PRIMARY PATENT EXAMINER